Research Paper | Social Science | E-ISSN No : 2454-9916 | Volume : 4 | Issue : 8 | Aug 2018

ADOLESCENCE – ISSUES AND CHALLENGES FOR HEALTH AND NUTRITION

Mr. Ashish Joy

Ph.D. Scholar, Faculty & Department of Social Work, Pacific Academy of Higher Education and Research (PAHER) University, Pacific Hills, Pratap Nagar Extension, Debari, Udaipur, Rajasthan – 313024, India.

ABSTRACT

Adolescents who make up roughly 20% of the total world population are not the beneficiaries of child health interventions and also are bereft of the schemes and benefits associated with adulthood leaving them in lurch. Today's Adolescents are tomorrow's adults and their health and well-being are crucial to the country and society. The present review outlines the issues that confront adolescents' health and nutrition and makes recommendations directed at the social, health and education sectors to improve the scenario regarding nutrition and health of adolescents in India and other developing countries.

KEYWORDS: Adolescence, Health, Nutrition, Malnutrition, Obesity.

Adolescents are the most important social assets and are vital to the present and the future of the Community and the Nation. Today's Adolescents are the Adults of tomorrow.

The World Health Organization defines Adolescence as the segment of life between the ages of 10-19 years. Adolescence is a transition phase through which a child becomes an adult. It is characterized by rapid growth and development in all the domains - physiological, psychological and social (WHO : 2006)

The individual experiences some unique changes that manifest themselves during this period which are aimed at the attainment of biological maturity (Tanner: 1992). Needless to state that this period is a critical period of transition.

As per the estimates of the World Health Organization, about 1/6th of the World's Population is comprised of Adolescents - 1.2 billion people aged 10 to 19 years (WHO:2014). It is also noteworthy that India has the largest adolescent population in the world; about 21% of the Indian population comprises of Adolescents i.e. 243 million people (MoHFW: Govt. of India 2014). Thus the Adolescents constitute a sizable proportion of Indian population as well.

Although the Adolescent boys and girls appear to be the healthiest subset of any population, the environmental, social and familial factors affect the quality of their health and nutrition in the short term as well as affect their lifetime health and survival. Besides these, young people are vulnerable to a number of diseases/ conditions in all the dimensions of health that is physical, mental and social. It has been established that many of diseases that manifest themselves in the adulthood/later life have their roots in adolescence. This is especially upsetting since many of the causes of mortality and morbidity in this age group are preventable, treatable and manageable thereby reducing ill-health and disability in the adult population.

However, it may be noted that despite being a time of Vulnerability, Adolescence is a time of greatest Opportunity as well. This is the period when young people develop and establish their thinking, perspective; relationships with peers and other adults; it can be safely surmised that a healthy adolescence is a solid foundation for being a healthy adult.

Despite all of the facts outlined above, it is an unfortunate reality that the Adolescents as a group have been relatively neglected, as they are neither children nor adults and are "stuck in between".

They have specific issues that call for specific strategies and interventions (USAID Policy Project: 2004) and require specific programs and policy consideration. However, most, if not all adolescents, especially in the developing countries have minimal or zero knowledge and skills needed to cope with the ongoing physical and physiological changes and health challenges. The Scenario with regard to Adolescent Girls is particularly disappointing. They have to face challenges like Malnutrition, Early marriages, Teenage Pregnancy, high risk of Sexually Transmitted Infections and Poor Nutritional status.

Adolescent girls, constituting nearly 10% of Indian population (as per 2011 census) are therefore one of the most vulnerable groups. They are the worst sufferers of the various conditions / diseases related to malnutrition because of their increased nutritional needs and low social standing. (Choudhary et al : 2009). The health and nutritional status of our mothers of tomorrow (i.e. the adolescent girls of today) is a critical factor for the nutritional status of the community. (Venkaiah et al : 2002)

Over the last few years, India as a whole has been consistently making strides in progress and improving its social and economic indicators, but it is common knowledge that the distribution of this progress has been unequal across the length and breadth of the country. There are large variations among the states/ districts as well as among the population sub groups. The condition of adolescents especially the rural adolescents is still far from satisfactory.

As outlined above, even though the adolescence is viewed as a healthy period, a number of health challenges (present as well as future) linger in the shadows especially in case of Adolescent Girls.

A number of adolescent girls have been found Malnourished and Anaemic along with being the recipient of inadequate dietary intake in various studies. (Reddy et al 1993 & Pushpamma et al 1982). The "State of the World's Children 2011" report from UNICEF states that more than half (56%) of adolescent girls in India are suffering from Anaemia. India also has the highest underweight adolescent girl population of 47% in age group of 15 to 19 years as per the same report. One of the main problems during this phase of growth is the inadequate calorie intake. A Joint Study by the Centre for Disease Control (CDC) Atlanta, U.S.A and the UNICEF has shown that girls in rural areas have about 1355KCals per day in the 13-15 years age group and about 1292 KCals per day in the 16-18 years age group. The values are much below the recommended allowances. The problem of malnutrition is further compounded by the onset of Menarche and the resulting Iron Deficiency, Intestinal worm infestations and inadequate food and general hygiene.

Apart from Nutritional issues, the adolescents are not faring well on the front of health as well. The World Health Organization's (WHO), special analysis in 1999 found that young people age 10 to 19, who constitute 19 percent of the world's population, account for 15 percent of the disease and injury burden worldwide. It also found that more than 1 million people in that age group die each year. (WHO; 1999) The top three causes of Disability Adjusted Life Years (DALYs) were found to be unipolar major depression, transportation accidents, and falls. The profile of disease burden was significantly different for younger and older adolescents. In the 10 to 14 age group, injuries and communicable diseases were prominent causes of DALYs. For the 15 to 19 age group, the disease burden shifted to outcomes of sexual behaviors and mental health.

The data and facts about important adolescent's health and nutrition issues in different areas still remain limited, but the most common health problems of adolescents are outlined below -:

1. **Lack of importance to the adolescent health issues and low priority for adolescent focused research:**
   Till the last few years, the health of adolescents had not been a major concern for public health and medical fraternity as they were considered less susceptible to malnutrition and other health related problems; thus the research has been limited. But in the recent years, it has been well recognized fact that deficiencies occurring during antenatal stage, infancy, preschool age and school age are passed on to the adolescence and the malnutrition often worsens. On the positive side though, adolescence presents us with the last opportunity for an individual to catch up growth and diminish the consequences of malnutrition.

   In our country, pregnancies during adolescence were quite common because

of the existence of child marriages; modernization in the recent times is now a major contributor to these pregnancies even though the child marriages have declined. It is quite clear that when the mother is still growing, there is competition between the mother's body and the foetus for energy and nutrients from the diet.

In recent times, substance abuse including Alcohol, Tobacco (chewable and non chewable) and narcotics consumption among adolescents is increasing by the day in our country but not much work is being done on its effect on adolescents.

2. Nutritional Susceptibilities and Opportunities:

From a physiological standpoint, adolescence is nutritionally crucial period in the human life cycle. The reasons for this are multifold. For starters, the growth rate at this stage is higher than at any other time in life (Brasel, 1982). This noteworthy increase in physical growth dramatically increases the need for nutrients and micronutrients. On top of that, there are social, economic and cultural factors and life style changes affecting the food habits of adolescents that in turn have an impact on both the nutrient intake & needs (Spear, 2000). It has also been documented that growing adolescents have increased nutrient requirement during pregnancy and illness (Scholl et.al, 1994; Story et al, 1999). Lastly, as mentioned above as well, it has been well documented that adolescence is the last opportunity to catch up growth if environment conditions permit. Thus in light of all of the above factors, adequate and good quality nutrition is a non negotiable requirement during this period. Adequate nutrition is therefore the foundation for the optimum development and is a pre-requisite for all round progress (Singer et al, 1995).

3. Changes in Adolescent lifestyle and eating behaviours.

Dietary habits, behaviors and patterns are vital to determining the nutritional status. Over the last years as a consequence of industrialization, urbanization, economic changes and modernization, the dietary patterns have exhibited a continuous transition.

An interesting fact pertaining to these changes is that they are often early exhibited and more pronounced among urban adolescents (Ahmed et al., 1998), as they are typically the initial consumers due to their exposure to marketing , availability of and attraction for new things, economic status. As adolescents grow, expand their outlook and look forward to the prospect of greater freedom they begin to eat outside home (Adamson et. al, 1996). Even though many of them comprehend the necessity of healthy eating habits; their lifestyles and dietary habits are to a large extent influenced the desire to fit in the prevailing social norms and peer pressures. This is especially true in case of girls who aim to attain a good body image as compared to their peers and in line with the role models. It is very common for adolescents to skip meals especially breakfast, have irregular meal timings, not carrying packed lunches to school/ college and to indulge in snacking.

These dietary patterns - specially snacking ; mostly on junk foods and energy dense foods, wide use of instant and fast foods that are low in nutrients and faulty dieting are more common among the urban adolescents. Snacking has been reported to provide up to one quarter of daily intake of energy in adolescents and is generally high in fat and sugar but low in nutrients. (Skinner et al., 1986 & Dausch et al.,1995).

A study by Cross et al (1994) revealed that majority of children snacked at least once a day, with 29% of the students even snacking four times a day. The most common among these snacks were the fast foods, chips, soft drinks, biscuits, and chocolates etc. as per Adamson et al (1992). Soft drinks were also common among adolescents (Baric et al, 2000). An important point that is noteworthy here is that most of these fast foods are being consumed between meals as a result they reduce one's appetite for regular meals therefore the adolescent's dietary patterns are further disturbed making them more prone to nutritional problems.

In this context while assessing the adequacy of adolescent diets, Malhotra et al (2007) reported that the average daily intake of milk & milk products, pulses, green vegetables, other vegetables & fruits were grossly inadequate meeting only 17%, 36%, 26%, 34% and 3% of the recommended daily allowances ; that of fats & oils and root & tubers was somewhat adequate meeting about 65% and 72% of the recommended daily allowance while the intake of cereals & sugar was almost adequate revealing deficit of only 7% & 3% of the recommended daily allowance. Thimmayamma et al in 1998 found out that in the upper income groups, the major sources of energy were milk & milk products, sugars, fats & oils. In contrast, the middle & low income groups mainly consumed cereal based foods particularly in rural populace.

The role of media has also been less than optimal in promoting healthy diets and life styles. The mass media surrounds us with images of the “thin ideal” for females. These messages and images that focus on the value of appearances and thinness for females have a significant negative impact on body satisfaction, weight preoccupation, eating patterns, and the emotional well-being of women. Research has demonstrated a direct relationship between media exposure and eating pathology, body dissatisfaction and negative affect (Stice et al 1994 & Utter et al, 2003).

4. Excessive Prevalence of Nutritional disorders in Adolescents and it's effects:

Social and Economic conditions, unhealthy dietary habits, eating behaviours and attitudes lead to nutritional deficiencies because the food intake deviates from the recommended levels. Malnutrition refers to all the impairments of health that result either from a deficiency or excess or imbalance of nutrients.

Malnutrition is a major public health problem among adolescents all over the world. It not only has a component that has a face in the present but is also has futuristic implications as it creates a lasting effect on the growth, development & physical fitness of people.

In a study by Malhotra A & Passi S J in 2007; 49% of adolescent girls were found to have energy intake less than 75% of the Recommended Dietary Allowance (RDA) and protein intake was between 68.0% - 79.8% of RDA. It has also been observed that the diet of adolescents was deficient in all nutrients especially protein, calcium, vitamin A, vitamin C (WHO, 2002; Venkaiah et.al, 2002).

a) Effects of under nutrition:

The effects of these nutritional deficiencies are marked as adolescents are very sensitive to inadequate nutrition (Baric et al, 2000). It has been well documented that the adolescents whose diets are lacking in nutrients necessary for growth and development not only fail to thrive but also are not able to attain their optimum growth potential.

Anthropometric measurements i.e. height and weight among a number of underprivileged and rural adolescents were found to be lower than the reference values given by the Indian Council of Medical Research - ICMR and the National Center for Health Statistics - NCHS. (Medhi et al, 2006 and Malhotra A & Passi SJ, 2007;). In contrast, height & weight of children and adolescents from well to do were significantly higher at all ages as compared to reference values (Bhasin et al, 1990).

Chronic Nutritional Deficiencies lead to a low body mass index and not only affects the academic and social performances but can also lead to lower work output (Narasinga Rao, 1996).

Several studies have indicated impaired ability to do physical work among the anaemic preschool and school aged children (Satyanarayana et al. 1990). While the anaemia which is of mild to moderate severity may not affect normal level of activity which requires only about 30% of maximal oxygen carrying capacity, severe Anaemia compromises even normal activity and work output (Narasinga Rao, 1996).

A review of literature available from the research undertaken in a number of developing countries demonstrates that early life cycle severe protein energy malnutrition requiring hospitalization has marked and long- lasting effects on mental development. All this has lead to a growing concern about low productivity among working population in third world countries (Narasinga Rao, 1996).

Apart from the above, the nutritional status with regard to certain minerals and vitamins can also affect growth, development and subsequent productivity of the individual. Low levels of haemoglobin due to iron deficiency Anaemia or vitamin B12 /folic acid deficiency Anaemia leads to a lower oxygen carrying capacity of blood and hampers physical activity, mental acuity and maximal work output as a result. (Narasinga Rao, 1996). It has also been well documented and demonstrated that iron deficiency Anaemia is associated with low mental performance, inattention, developmental delays, lower learning capacity & scores on psychological test, difficulties with memory and also leads to long term deficits in cognitive function/ school performance.

Among other micronutrients, Iodine deficiency is well known to cause mental retardation and cretinism. Iodine- deficient children suffer from sluggishness, tardy concentration and impaired concentration, which result in poor school performance. In iodine deficient areas, children have IQ lower by 13 points than the children living in iodine sufficient areas (Bleichrodt, 1994). Significant improvement in mental development, school performance and motor development has been demonstrated with iodine supplementation of primary school children.

The mild forms of Vitamin A deficiency cause impaired immune function and an increased risk of morbidity from infectious disease that can adversely affect school attendance and academic performance.

Adolescents whose diets are lacking in nutrients face various disorders in later stages of life like osteoporosis, anaemia, cardiovascular diseases etc. (Turan et al, 2009).

b. Effects of Overweight and Obesity:

The prevalence of overweight and obesity is increasing in India and the World as a result of prosperity, urbanization and industrialization, abundant availability of food and in sedentary life style. It has been known that the interactions among genetic and environmental factors play a part in the development of obesity. Major environmental factors include change in dietary patterns and lack of physical activity. Among the adolescents especially in urban areas, time spent on recreational activities like Television, Video Games, the internet and studies leaves little time for outdoor play. Even in period assigned for physical activity in schools many boys and girls do not participate. (Ranjani et al.; 2014).

In the Indian scenario, in 2010, the prevalence of childhood obesity has been estimated at 19.3 per cent which was a significant increase from the earlier prevalence of 16.3 per cent reported in 2001-2005. (Ranjani 2016).

Obesity is associated with increased risk of morbidity and mortality as well as decreased life expectancy as it adversely affects the cardiovascular, endocrine, gastro intestinal, neurological, orthopedic, psychosocial and pulmonary systems of the body.

Also as a result of overweight and obesity, the concept of 'body image' has become very common among adolescents; especially girls ; this subjective component of feeling satisfied or not with one's body; and its behavioral aspects lead to psychiatric morbidities among adolescence as well as later in life.

5. Sexual Health Issues:

The Reproductive and Sexual Health of Adolescents are particularly important in the Indian context. The Median age at marriage for girls in rural areas is astoundingly less at 14.5 years and Adolescent pregnancy is much common as 50% of women in India had a child before reaching the age of 20. Despite the laws prohibiting marriage to young women before age 18 and to young men before age 21, marriage continues to take place in adolescence for significant proportions of young women. While the age at marriage for women have undergone an increase over the last few years; almost half of all women aged 20–24 were married by 18 years as recently as in 2006. (NFHS 3, International Institute for Population Sciences and Macro International, 2007). Further, wide disparities are evident in marriage age: poor, rural and poorly educated young women and those from scheduled castes (SCs) and scheduled tribes (STs) are considerably more likely than other women to have experienced child marriage.

As per the WHO Data, about 16 million girls aged 15 to 19 and some 1 million girls under 15 give birth every year—most in low- and middle-income countries. Complications during pregnancy and childbirth are the second leading cause of death for 15-19 year-old girls globally. Every year, some 3 million girls aged 15 to 19 undergo unsafe abortions. Babies born to adolescent mothers face a substantially higher risk of dying than those born to women aged 20 to 24 (WHO 2014).

Also as per the WHO data, the proportion of currently married adolescents aged 15-19 years is 27% and the proportion of married adolescents aged 15-19 years who have already begun childbearing is 35%. As a result of early marriage, childbearing is initiated early and multiple pregnancies characterize the life of many young women. 20% among the young women aged 20–24 had their first child before they were 18, and one in eight young women aged 20–24 had three children (NFHS 3, International Institute for Population Sciences and Macro International, 2007). Rural young women were twice as likely as urban women to have their first birth by age 18. Thus, both maternal and neonatal mortality are higher among the younger age groups than among older women; 45 percent of all maternal deaths take place among those aged 15–24 (Office of the Registrar General, India, 2011) and neonatal mortality rates range from 54 per 1,000 live births among those aged 15–19 to 34 and 38, respectively, among those aged 20–29 and 30–39 (NFHS 3, International Institute for Population Sciences and Macro International, 2007). Rural adolescents are particularly at risk with neonatal mortality rates as high as 60 per 1,000 live births (compared to 31 among urban adolescents). Apart from that, unplanned fertility is experienced by considerable proportions of young women. As many as 14 percent and 18 percent of births to adolescent mothers and young mothers, respectively, in the five years preceding the National Family Health Survey (NFHS)-3 survey, were unplanned (NFHS 3, International Institute for Population Sciences and Macro International, 2007).

Sexually transmitted diseases may also occur in any sexually active adolescent. The younger the adolescent is at the time of initiation of sexual activity, the higher the risk of infection. These diseases may include Gonorrhea, Syphilis, Human Papilloma virus infection, Hepatitis B and HIV/AIDS etc. NFHS data suggest that young women were as likely as adult women to report STIs or symptoms of STIs (NFHS 3, International Institute for Population Sciences and Macro International, 2007). About a quarter of the patients attending the government STI clinics are younger than 18 years old (Ramasubban- 1995) and more than half of all new cases in India are among 10 to 24 years of age (UNAIDS estimates - 2002).

As regards HIV prevalence, data indicate that age-specific HIV prevalence rates are similar among young men and young women aged 15–24 (0.09 and 0.11 respectively) (Parasuraman et al, 2009).

6. Mental Health Problems:

Like many physical ailments, most mental disorders begin during youth (12–24 years of age), although they are often detected later in life. The Poor status of mental health often leads to other challenges in adolescents like lower educational achievements, substance abuse, violence, and poor reproductive and sexual health. Mental health problems affect 10–20% of children and adolescents worldwide (Kieling, Christian et al. 2011). Despite their relevance as a leading cause of health-related disability in this age group and their long lasting effects throughout life, the mental health needs of children and adolescents are neglected, especially in low-income and middle-income countries. Girls are particularly susceptible and Psychological problems in Adolescent Girls include Emotional disturbances, Depression, low self-esteem and anxiety over inadequate or excessive secondary sexual development, Acne etc. As per a meta-analysis, the prevalence rate of child and adolescent psychiatric disorders in the community has been found to be 6.46%. (Malhotra, 2014)

Adolescent girls also experience anxieties and problems regarding body and breast changes which are normal and common for this age. The source of anxiety includes Breast asymmetry, being Flat Chested and Breast enlargement which may cause embarrassment, back pain and postural problems. Periodic problems like Physiological breast swelling and pain may occur on a cyclic basis, most commonly during premenstrual phase. This is normal and is due to hormonal stimulation. All these variations are a constant source of worry and anxiety for the adolescent girl.

Anxieties and problems regarding Menstruation are also fairly common as some varieties of Menstrual Dysfunctions occur in about half of the adolescent females.

Substance Abuse also is a problem that begins in adolescence. 40 per cent of males and 5 per cent of females aged 15 to 24 yr consumed tobacco nationwide (NFHS 3, 2009) . Systematic review of 15 studies across India aged 13-15 yr showed a median prevalence of tobacco use (ever users) to be 18.2 per cent; 14 per cent among males and 6.3 per cent among females (Pal et al, 2009). Global Youth Tobacco Survey (GYTS) 2006 and 2009 across India covering 13 to 15 yr old adolescents in 180 schools highlighted an increase in the current users of any form of tobacco from 13.7 to 14.6 per cent and current users of cigarette from 3.8 to 4.4 per cent from 2006 to 2009 (Gajalakshmi et al, 2010)

The World Health Survey - India reported that among individuals aged 18 to 24 yr, 3.9 per cent were infrequent heavy drinkers and 0.6 per cent were frequent heavy drinkers (WHO 2003) Apart from these, Chaturvedi et al in 2004 reported that among 10-29 yr old individuals, apart from tobacco and alcohol use, 2.2 per cent of men and 0.3 per cent of women were opium users.

7. Challenges arising due to Violence and Low Social Status:

Interpersonal and community violence, physical abuse and family violence leads to significant rates of injury and deaths in adolescent girls. One in five girls in India has experienced physical violence since 15 years of age as per the National Family Health Survey data. The data also stated that 4.5 percent of girls aged between 15 and 19 years have experienced forced sexual intercourse or other forms of forced sexual acts and in 77 percent of such cases, the perpetrator of sexual violence is the husband or partner.

Studies have also reported that 19 to 42.8 per cent of adolescent females had experienced domestic violence (Ackerson et al 2008 & Sarkar, 2010) and 25.3 and 32.2 per cent of young married women experienced physical and sexual violence within marriage, respectively (Acharya et al, 2009) . Deb et al in 2010 reported in a sample of students aged 14 to 19 yr showed that 20.9, 21.9 and 18.1 per cent of the children experienced psychological, physical and sexual violence, respectively.

Unhealthy and Malnourished Adolescents trapped in the cycle of Violence and Early Pregnancy give birth to undernourish and at risk babies, thereby adding another generation of citizens with poor health and nutrition status.

RECOMMENDATIONS:

The biggest challenge of adolescent nutrition is to decrease the prevalence of malnutrition among adolescents by improving their nutritional status. India is facing a dual burden of under nutrition on one side and obesity on the other. Few action points that are urgently needed to tackle these dual challenges are as follows-:

1) Ensuring availability of Food :

Although the food production has increased in India after independence, the population and food requirement have grown disproportionately. At the

same time there are wide inequalities in availability of food across states and socio economic strata. In India the per capita availability of milk, pulses, egg, etc. is much less as compared to Recommended Dietary Intake (RDI) values advocated by ICMR. Therefore, along with other age groups, adolescents also get smaller share of food. Therefore there is a need to increase food production and strengthen and streamline the food storage and distribution to ensure no wastage and equality in distribution. Also the coverage of focused interventions like the mid-day meal scheme should be increased, at present the coverage is only for the students studying up to class V or VIII. The scheme needs to be to extend to all the school children studying up to class XII. Furthermore at present the scope of the scheme is limited only to cover the energy and protein requirements; it is the need of the hour to fulfill the micronutrients need also.

Lastly, family planning efforts are also need strengthening to decelerate the rate of increase in our population.

2) Improving nutrition literacy:

It is well proven that the Educational level of mothers affects the nutritional status of their children. In addition to literacy and education, nutrition education through ICDS, schools and colleges needs to be imparted. Every adolescent and young adult should be aware about the amount of nutrients required, importance of breakfast and other meals, healthy way of dieting; how to make healthy snacks. The educational system should be used to cultivate healthier food habits among school children. These food habits are likely to become permanent by the time they leave school and become adults.

3) Fight against Obesity and discouraging the use of junk foods:

Past experience has shown that Tobacco tax increase is one of the most effective ways to reduce smoking and other tobacco use, especially among kids. Every 10 percent increase in cigarette prices reduces youth smoking by about seven percent and total cigarette consumption by about four percent. On the similar lines, the taxes on junk food and fast foods needs to be increased to discourage consumption. Also on the same model as the Government banning the advertisements of infant milk formula and infant foods, Advertisements of colas, chips, ready to cook refined wheat flour made foods should be banned. Commercials of the food chains serving only burgers, French fries, pizzas, etc. should also be banned as these attract the adolescents who get fascinated by the advertisements and consider the consumption 'in vogue'.

Adolescents are also very concerned about their body image. Boys aspire to have broad shoulders with well developed muscles, whereas girls dream to have slim body with zero size figures. The adolescents often resolve to fads and faulty means of dieting, skipping meals, joining slimming centres etc. The problem of obesity at the public health level cannot be solved by the chain of slimming centers we have today, which claim to promise rapid weight reduction. The deleterious effects of repeated loss & gain of body fat (cycling) are now well reported (Amigo, 2007 & Mehta et al 2014). An intensive programme of heath education through the media & the school should be run on the problem of overweight/ obesity which should be designed to promote healthy dieting practices & regular physical exercise.

4) Promoting sex education and family planning:

In India, child marriages are still quite common. As a result, adolescent girls get pregnant at very early age when they are still growing. As a result of modernization, the number of unwed pregnant adolescence girls is also increasing because they don't have any sex education. Many married girls become the mother of two-three children when they reach 21 years of age. They get pregnant again before they regain their adequate nutritional status. So, our social system and our education and health departments need to undertake campaigns to provide them with family planning education.

5) Establishing Gender equality:

Even after 7 decades of independence, in India – women and girls are still sexually discriminated. Female adolescents don't get chance to eat costlier nutritious foods like milk and milk products, fruits, nuts, pulses, etc. Those mothers, who give birth to female child, are not properly taken care of and are not even given proper food. This leads to malnutrition among them. It is imperative that the disparity between males and females and unequal male and female social dispositions such as power relations in general and specifically the adolescent girl's health risks and health seeking behaviors be tackled suitably. The national health programs should include gender awareness as one of the major strategies and should have interventions aimed at gender sensitive, equitable access to quality health services as necessary for the improved health status of the population.

6) Improving health care service delivery:

Although health care in India is improving but the services are still below par. The focus should be on Preventive and Promotive Health services and micronutrient supplementation for adolescents, awareness and education and checkups and provision of suitable treatments. Although the govt. has started Iron and folic acid supplementation program in educational institutions but its coverage needs to be increased. Other health interventions also need to be developed like with emphasis on meeting protein and energy requirements and providing micro-nutrients such as needs of calcium and iodine; the health department and ICDS should make efforts to include all adolescents whether it be a boy or a girl, in various health care schemes.

7) Strengthening the counseling services:

Adolescent comprise a special group of the population and hence their needs should be appropriately addressed by available programmes and services. Health services and counseling are areas of intervention for improving adolescent health. Adolescent care services should be adolescent friendly, affordable, accessible, confidential and non-judgmental to improve the access and utilization health care services by adolescents.

It is the need of the hour to integrate adolescent health services into the existing health care delivery system and also develop innovative models for adolescent-friendly health services and provide health care services and counseling irrespective of marital status. Involvement of and linkages with youth clubs, NGOs and the private sector to expand and improve service delivery for adolescents can be of much use to improve counseling services.

8) Ensuring Safe and Supportive Environment:

A conducive, safe and supportive environment is necessary at various levels for undertaking adolescent health and development initiatives. Legal frameworks play an invaluable role in protecting the rights of adolescents. Advocacy to review and reform existing policy and legislation to create a supportive environment for adolescent health and development is needed followed by Strengthening the collaborative efforts between government (relevant line ministries) and NGOs for resource generation and implementation of policy and legal provisions,

It will also be important to Sensitize parents, teachers and social leaders on needs and issues related to adolescent health and development through IEC (Information, Education and Communication and IPC (inter-personnel communication),Promoting partnership approaches between youth clubs, CBOs and VDCs to explore and use the local resources for adolescent health and development, and legal provision to discourage the use of tobacco, alcohol, and other harmful substance by adolescents (by increasing pricing, restricting availability and promoting no smoking areas) are needed.

9) Intersectoral Collaboration:

The adolescent health and development efforts need multidisciplinary and multi-sectoral initiatives. Linkages with various stakeholders are very important for ensuring adequate resource and allocated. All related sectors like education, health, population and environment, law and justice, women children and social welfare should make collaborative efforts to address the problems and issues of adolescents.

10) Research in Adolescent Nutrition Health and Development:

Research is an integral part of evidence-based policy development and service delivery. However, the availability of adolescent specific information is limited for designing appropriate policies, plans and programs. Periodic research and studies are necessary for measuring impact and the effectiveness of programs. This is important to ensure the appropriate and optimum use of available resources.

CONCLUSION:

Adolescents are tomorrow's adult population and their nutritional status and resultant health, intelligence and productivity is very important for future development of our country. Hence, we cannot neglect adolescents. As a result of changing lifestyle and eating behavior, very high percentage of our adolescents is suffering from nutritional deficiencies as well as excess of nutrients. This has far reaching consequences. Our biggest challenge is to reduce the prevalence of malnutrition among adolescents. This can be achieved by improving per capita food availability, promoting sex education and family planning, developing sexual equality, management of obesity, improving health care facilities and regular health checkups, improving nutrition literacy rate, extending mid day meal scheme and ban on the advertisements of junk foods. All these tasks are quite challenging and require a significant budgetary provision but as has been said-Investing in nutrition and health of adolescents is a necessity, not a luxury in today's world.

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